

CLAIMS

1. A method for producing retinal nerve cells, the method comprising the steps of:

co-culturing embryonic retinal stem cells and iris pigmented epithelial cells; and

inducing differentiation of the iris pigmented epithelial cells into the retinal nerve cells.

2. The method according to Claim 1, wherein the iris pigmented epithelial cells are derived from a mammal.

3. The method according to Claim 1 or 2, wherein the embryonic retinal stem cells are derived from a bird.

4. The method according to any one of Claims 1 to 3, wherein the iris pigmented epithelial cells are isolated from an eyeball and then selectively cultured by a floated coagulated mass culturing technique.

5. The method according to any one of Claims 1 to 4, wherein the isolating of the iris pigmented epithelial cells includes:

an iris-tissue-extirpating step of extirpating iris tissue from the eyeball; and

an iris-pigmented-epithelium-separating step of separating an iris pigmented epithelium from the iris tissue thus extirpated.

6. Retinal nerve cells obtained by a method according to any one of Claims 1 to 5.

7. A method for producing retinal nerve cells, the method comprising the steps of:

isolating iris pigmented epithelial cells from an eyeball; and

performing adherent culturing of the iris pigmented epithelial cells with a serum-free culture medium so as to induce differentiation of the iris pigmented epithelial cells into the retinal nerve cells.

8. The method according to Claim 7, wherein the iris pigmented epithelial cells are derived from a bird or a mammal.

9. The method according to Claim 7 or 8, wherein the serum-free culture medium when the adherent culturing starts contains at least one of FGF2, FGF9, and CNTF with a concentration in a range of 1 to 100 ng/ml.

10. The method according to any one of Claims 7 to 9, wherein the iris pigmented epithelial cells in the serum-free culture medium when the adherent culturing starts has a cell density of  $1 \times 10^5$  cells/cm<sup>2</sup> or less.

11. A method for producing retinal nerve cells, the method comprising the steps of:

isolating iris pigmented epithelial cells from an eyeball;

starting adherent culturing by implanting the iris pigmented epithelial cells in a culture medium containing FGF2 and/or FGF9; and

after the step of starting the adherent culturing, inducing differentiation of the iris pigmented epithelial cells into the retinal nerve cells by performing the adherent culturing of the iris pigmented epithelial cells by using the culture medium to

which CNTF is added and from which FGF2 and/or FGF9 is removed.

12. The method according to Claim 11, wherein when the culture medium is a serum-free culture medium in the step of starting the adherent culturing, a serum is further added to the culture medium in the step of inducing the differentiation into the retinal nerve cells.

13. Retinal nerve cells obtained by a method according to any one of Claims 7 to 12.